

NASA TECH BRIEF

Ames Research Center

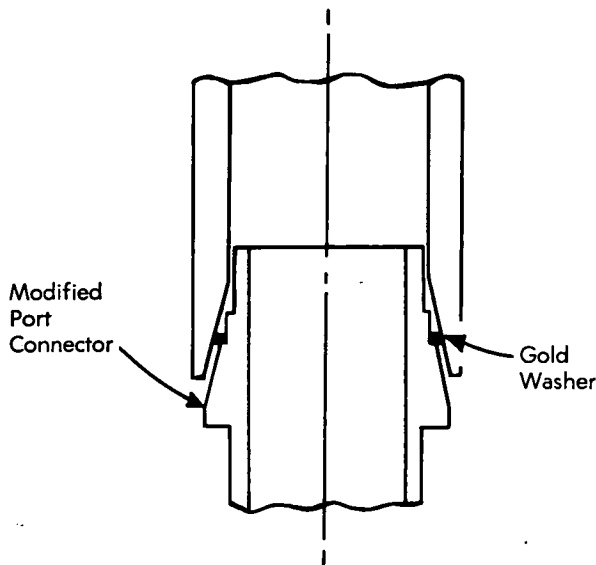


NASA Tech Briefs announce new technology derived from the U.S. space program. They are issued to encourage commercial application. Tech Briefs are available on a subscription basis from the National Technical Information Service, Springfield, Virginia 22151. Requests for individual copies or questions relating to the Tech Brief program may be directed to the Technology Utilization Office, NASA, Code KT, Washington, D.C. 20546.

Low-Closing-Force Seal

The problem:

To attach tubes to vessels containing gas samples by a technique which effects seals with a minimum of applied force and does not contaminate the contents.



The solution:

Compress a soft, inert metal gasket between a cone and a corresponding socket.

How it's done:

A shouldered land is machined on the 4:1 tapered surface of a 0.952-cm ($\frac{3}{8}$ -inch) stainless steel port connector so that a gold washer 0.025-mm (0.010-inch) thick, with ID of 1.039 cm (0.405-inch) and an OD of

1.080 cm (0.425-inch), can be fitted snugly. As shown in the diagram, the land is positioned on the tapered surface so that the washer extends about 0.13 mm (0.005-inch) when in contact with the machined shoulder.

The seal is formed when the port connector is pushed firmly into its socket; the gold washer is deformed and forced to flow into imperfections and scratches in the surfaces of the socket and the machined land. A force as low as 552 kN/m² (80 psi) applied to the ends of the fitting effects a seal which has a leakage rate less than 1×10^{-10} ml (STP)/sec of helium.

Other types of seal configurations require more force for closure than the one described above; soft metals other than gold can be used as washers.

Note:

No additional documentation is available. Specific questions, however, may be directed to:

Technology Utilization Officer
Ames Research Center
Moffett Field, California 94035
Reference: B73-10380

Patent status:

NASA has decided not to apply for a patent.

Source: Lyle E. Bergquist of
Martin Marietta Corporation
under contract to
Ames Research Center
(ARC-10775)

Category 06